

# ON A COLLECTION OF FEATHER STARS, OR COMATULIDS, FROM JAPAN.

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The United States National Museum has recently received from Mr. Alan Owston, of Yokohama, a small, but very interesting, collection of unstalked crinoids made by Mr. Owston in Tokyo and Sagami bays and in Suruga Gulf, deposited by Mr. Frank Springer for study in connection with the material obtained in somewhat deeper water by the U. S. Fisheries steamer *Albatross*.

Although containing only one hundred and thirty-one specimens, including forty-eight of *Calometra multicolor* and thirty of *Cyllumetra albopurpurea*, there are three species new to science, *Comaster imbricata*, *Eudiocrinus variegatus*, and *Thalassometra komachi*, one which was previously known only from a single *Challenger* specimen, *Charitometra distincta*, two previously known only from the types in the Museum of Comparative Zoology, *Compsometra serrata* and *Iridometra psyche*, and three, *Himerometra subcarinata*, *Thalassometra aster*, and *Charitometra lata*, known only from the types in the U. S. National Museum. Of especial interest also is a series of seven specimens of *Tropiometra afra*, affording an opportunity for a direct comparison of Australian and Japanese examples of this remarkable species.

## Order COMATULIDA.

### Family COMASTERIDÆ.

Genus COMASTER L. Agassiz.

COMASTER ROBUSTIPINNA (P. H. Carpenter.)

*Sagami Bay*; 35° 06' north latitude, 139° 42' east longitude; 30 fathoms; April 24, 1902. (Owston collection, No. 7215.)

One specimen, with 38 arms.

*Sagami Bay*, off Yenoshima; "probably 50 fathoms;" May 17, 1902. (Owston collection, No. 7217.)

One specimen, with 40 arms.

*Sagami Bay*, off Yenoshima; March 27, 1905. (Owston collection, No. 9275.)

Two large specimens.

*Sagami Bay*; 35° 11' north latitude, 139° 45' east longitude; 50 fathoms; June 30, 1901. (Owston collection, No. 6147.)

One specimen.

*Saruga Gulf*; April 12, 1903. (Owston collection, No. 7892.)

One specimen.

COMASTER JAPONICA (J. Müller).

*Tokyo Gulf*; Uraga channel; 25 fathoms; June 16, 1901.

One specimen with 22 arms.

*Sagami Bay*; 35° 11' north latitude, 139° 41' east longitude; 140 fathoms; May 25, 1902. (Owston collection, No. 6929.)

One specimen, approaching *C. solaster*, with 20 arms.

*Sagami Bay*; 300 fathoms (??); May 5, 1902. (Owston collection, No. 6932.)

One specimen, approaching *C. robustipinna*, with 29 arms.

*Sagami Bay*; 35° 04' north latitude, 138° 48' east longitude; 80 fathoms; August 10, 1902. (Owston collection, No. 7194.)

One specimen, with the carination of the proximal pinnule joints much more marked than usual.

*Sagami Bay*; 35° 03' north latitude, 138° 47' east longitude; 110 fathoms; August 15, 1902. (Owston collection, No. 7011.)

One specimen.

COMASTER PARVICIRRA (J. Müller).

*Sagami Bay*; 35° 02' north latitude, 138° 50' east longitude; 55 fathoms. (Owston collection, No. 7036.)

One specimen with exactly 30 arms, the distichals 4 (3+4), the palmars, which are only developed on the inside of the rays, in 1, 2, 2, 1 order, 2.

*Sagami Bay*; 35° 06' north latitude, 139° 42' east longitude; 30 fathoms; April 24, 1902 (Owston collection, No. 7215); or 34° 59' north latitude, 139° 33' east longitude; 60 fathoms; April 20, 1902. (Owston collection, No. 7214.)

One specimen with 30 arms, similar to the preceding.

COMASTER IMBRICATA, new species.

The centro-dorsal is large, discoidal, the dorsal surface flat, bearing a single, somewhat irregular, row of cirrus sockets.

There are twenty-five cirri, 20 mm. to 30 mm. long, with twenty-two to thirty (usually about twenty-five) joints; those in the basal half are squarish, those in the distal are not quite so long as broad; after the eighth joint the distal edges begin to project dorsally in the shape of a broadly rounded serrate ridge, appearing like a spine in lateral view; this ridge gradually moves nearer and nearer the middle of the dorsal surface, and in the terminal joints occupies

a median position; the opposing spine is short and transversely linear, forming a ridge across the entire dorsal surface of the joint; the terminal claw is stout, moderately curved, about equal to the penultimate joint in length; the ventral distal ends of the cirrus joints are more prominent than usual, and show a tendency to overlap.

The radials are concealed; the first costals are short and broad, partially united laterally; the costal axillaries are very broadly pentagonal or almost triangular, about twice as broad as long, widely separated laterally; eight of the ten distichal series are 4 (3+4), the remaining two being 2; these last bear no palmars; there are six palmar series of 2 and two of 4 (3+4); there is a single post-palmer series of 4 (3+4) following a palmar series of 2. There are about 30 arms 90 mm. long, all the joints with very strongly produced and overlapping distal edges; the first three or four joints are discoidal, the remainder quadrate or almost triangular, about twice as broad as long. The first syzygy is between the third and fourth brachials, the next near the eleventh and twelfth, and syzygia occur distally at intervals of about four oblique muscular articulations.

The distichal pinnule is about 16 mm. long, and not especially stout, the proximal joints with rather prominent distal ends, but not carinate; the first and second brachial pinnules are similar, but shorter, and the third is but 5 mm. long; the distal pinnules have the basal joints with prominent distal ends.

*Color* (in spirits).—Brownish yellow, the cirri lighter with occasional dark bands.

*Type*.—Cat. No. 22697, U.S.N.M.

*Sagami Bay*; 35° 06' north latitude, 139° 42' east longitude; 50 fathoms. (Owston collection, No. 7216.)

The very strong imbrication of the brachials, and the broad, rounded, transverse ridge, appearing spine-like in lateral view, on the cirrus joints, separate this species from all the other Pacific species of the genus, while the method of arm-division and the position of the first syzygy separate it from all the species known from the Atlantic.

### Family ZYGOMETRIDÆ.

Genus EUDIOCRINUS P. H. Carpenter.

EUDIOCRINUS VARIEGATUS A. H. Clark.

*Sagami Bay*; 34° 59' north latitude, 139° 34' east longitude; 60 fathoms; April 17, 1902. (Owston collection, No. 6931.)

One specimen (the type).

## Family HIMEROMETRIDÆ.

Genus HIMEROMETRA A. H. Clark.

HIMEROMETRA SUBCARINATA A. H. Clark.

*Tokyo Gulf*; Uraga channel; 25 fathoms; May 26, 1901. (Owston collection, No. 6067.)

One specimen, resembling the type, but very dark, nearly black in color.

*Tokyo Gulf*; Uraga channel; 30 fathoms; May 17, 1901. (Owston collection, No. 6052.)

Two specimens, resembling the preceding.

*Sagami Bay*; 34° 47' north latitude; 138° 44' east longitude; 56 fathoms; August 20, 1902. (Owston collection, No. 7173.)

One specimen, resembling the preceding.

*Sagami Bay*; 35° 02' north latitude, 138° 52' east longitude; 50 fathoms; August 6, 1902. (Owston collection, No. 7016.)

Three specimens, resembling the preceding.

This species was previously known only from the southern part of the Sea of Japan.

Genus OLIGOMETRA A. H. Clark.

OLIGOMETRA JAPONICA (Hartlaub).

*Sagami Bay*; 35° 02' north latitude, 138° 50' east longitude; 55 fathoms. (Owston collection, No. 7036.)

The collection contains one specimen, agreeing well with Hartlaub's original description. There are twenty-seven cirri, 10 mm. long, with sixteen to twenty-one (most commonly eighteen or nineteen) joints, all subequal, approximately squarish, the fourth and fifth and those following bearing a low transverse serrate ridge, situated in the middle of the joint, appearing as a short dorsal spine in lateral view. The opposing spine is short, but prominent, rather less than half the diameter of the penultimate joint in height, situated in the middle of the dorsal side. The terminal claw is about equal in length to the penultimate joint, moderately stout, and rather abruptly curved.

Arms about 40 mm. long, as in Hartlaub's specimen; the proximal brachials are smooth, the middle and distal somewhat overlapping; syzygia occur between the third and fourth brachials, again between the ninth and tenth to fifteenth and sixteenth, and distally at intervals of five to nine (usually six) oblique muscular articulations.

The first three pinnules are approximately equal in length, 8 mm. long, with about fifteen joints, the first short, the second squarish, the remainder elongate; the joints in the proximal half are smooth,

those in the distal with strongly produced and overlapping spinous distal edges; the fourth pinnule is only 5 mm. long, and the following increase rather rapidly to 8 mm., which length they maintain almost to the end of the arm.

*Color* (in formalin).—Purple, the cirri yellow with a broad purple band about the middle of each joint; two regenerated arms are yellow.

The equality in size of the three proximal pinnules and the proportionately long cirrus joints appear to be constant characters for the differentiation of this species from *O. serripinna*.

Genus CYLLOMETRA A. H. Clark.

CYLLOMETRA ALBOPURPUREA A. H. Clark.

*Sagami Bay*; 35° 02' north latitude, 138° 50' east longitude; 55 fathoms. (Owston collection, No. 7036.)

Eleven small specimens; four with 10 arms; two with 11; two with 12; two with 13; one with 14.

*Sagami Bay*; off Sunosaki; 55 fathoms; May 8, 1899. (Owston collection, No. 5417.)

One specimen with 16 arms.

*Sagami Bay*; 35° 06' north latitude, 139° 42' east longitude; 30 fathoms; April 24, 1902 (Owston collection, No. 7215); or 34° 59' north latitude, 139° 33' east longitude; 60 fathoms; April 20, 1902. (Owston collection, No. 7214.)

Two small specimens, one with 10, the other with 15 arms.

*Sagami Bay*; 34° 58' north latitude, 138° 45' east longitude; 77 fathoms; August 13, 1902. (Owston collection, No. 9274.)

One specimen.

*Sagami Bay*; 35° 13' north latitude, 139° 45' east longitude; 40 fathoms; November 9, 1902. (Owston collection, No. 7283.)

One specimen.

*Sagami Bay*; 35° 11' north latitude, 138° 43' east longitude; 30 fathoms; December 1, 1901. (Owston collection, No. 6659.)

Five specimens; one with 14 arms; one with 18; two with 20; one with 21; the last has the single palmar series developed on the outer side of one of the rays; on one arm the syzygial pair consisting of the third and fourth brachials is repeated, neither bearing a pinnule.

*Sagami Bay*; 55° 13' north latitude, 139° 45' east longitude; 40 fathoms; November 9, 1902. (Owston collection, No. 7283.)

One specimen with 20 arms.

*Sagami Bay*; off Aburatsubo; 60 fathoms; April 2, 1899. (Owston collection, No. 5417.)

One specimen.

*Sagami Bay*; 35° 11' north latitude, 139° 45' east longitude; 50 fathoms; June 30, 1901. (Owston collection, No. 6106.)

One specimen with 20 arms.

*Sagami Bay*;  $34^{\circ} 59'$  north latitude,  $139^{\circ} 34'$  east longitude; 55 fathoms; April 23, 1902. (Owston collection, No. 6332.)

One small specimen with 13 arms.

*Tokyo Gulf*; Uraga Channel; 25 fathoms; May 26, 1901. (Owston collection, No. 6067.)

One specimen with 13 arms.

*Tokyo Gulf*; Uraga Channel; 20 to 30 fathoms; April 21, 1901. (Owston collection, No. 5780.)

One specimen with 20 arms.

*Tokyo Gulf*; 8 to 12 fathoms; October 22, 1899. (Owston collection, No. 5586.)

One specimen with 20 arms, large and richly colored.

*Tokyo Gulf*; Uraga Channel; 80 fathoms; June 8, 1900. (Owston collection, No. 6357.)

Two small specimens, one with 15, the other with 20 arms.

#### Family THALASSOMETRIDÆ.

Genus THALASSOMETRA A. H. Clark.

THALASSOMETRA ORION (A. H. Clark).

*Sagami Bay*;  $35^{\circ} 03'$  north latitude,  $138^{\circ} 47'$  east longitude; 85 fathoms. (Owston collection, No. 7010.)

One specimen.

THALASSOMETRA QUINQUECOSTATA (P. H. Carpenter).

*Sagami Bay*;  $35^{\circ} 03'$  north latitude,  $138^{\circ} 47'$  east longitude; 110 fathoms. (Owston collection, No. 7189.)

One specimen, yellow, a broad median line on costals, distichals, and arms, and a lateral line on arms, white; cirri banded yellow and white; pinnules blotched yellow and white.

*Sagami Bay*; off Yenoshima; April, 1896. (Owston collection, No. 6275.)

One specimen, colored like the preceding.

*Sagami Bay*;  $35^{\circ} 04'$  north latitude,  $138^{\circ} 48'$  east longitude; 80 fathoms; August 8, 1902.

One specimen, colored like the preceding.

THALASSOMETRA ASTER (A. H. Clark).

*Sagami Bay*; off Okinose; 400 fathoms; March, 1900. (Owston collection, No. 6679.)

One fine large specimen, much larger than the type, but exhibiting the same characters.

## THALASSOMETRA KOMACHI, new species.

The centro-dorsal is bluntly conical or short-columnar, the cirrus sockets closely crowded and arranged roughly in three columns in each radial area, two to a column; the bare polar area is granulose.

The cirri are twenty-five in number with forty to fifty-five joints, 40 mm. long for the longer, 25 mm. for the shorter, basally slender and rounded, becoming much compressed and broad distally; the first four or five joints are about twice as broad as long; the next joint is squarish; the next is about twice as long as its proximal diameter, decreasing in diameter distally; the cirrus decreases in diameter at this point, the elongated transition joint being dull and dark like the preceding in its anterior two-thirds, and highly polished like the succeeding in its distal third; the joints following the transition joint are approximately squarish (the first being usually longer than broad), gradually becoming shorter and very short distally; at about the fourth joint beyond the transition the distal dorsal edge begins to project, soon becoming a deep dorsal spine, which arises from the whole of the dorsal border; the dorsal spines on the terminal joints decrease in height; the opposing spine is short and blunt, terminally situated, not reaching half the breadth of the penultimate joint in height; the terminal claw is stout and moderately curved, rather longer than the penultimate joint.

The disk is scantily plated, except along the ambulacra, but the brachial and pinnule ambulacra are well plated. The sacculi are abundant on the brachial and pinnule ambulacra.

The ends of the basal rays are visible as prominent, though small, tubercles in the angles of the calyx; the radials have a strongly curved distal border, not visible in the median line, but extending far up in the angles of the calyx and surrounding the ends of the basal rays, reaching as high as the lateral angles of the costal axillaries; the first costals are laterally concealed by the interradial anterior extension of the radials and are visible as a triangle (apex downward) in the median line, the edges everted and roughened; the costal axillary is over twice as broad as long, rhombic, rising to a low tubercle with the first costal, the edges all around everted and roughened, the dorsal surface (as in the first costal) perfectly smooth; the distichals are 2, present on all the arms, resembling the costals; there are no palmars. There are twenty arms, 125 mm. long; the first brachial is wedge-shaped, the longer side out; the second brachial is nearly twice as large, but similar; the following to about the tenth are oblong, about twice as broad as long, soon becoming triangular, broader than long, gradually becoming as long as broad, and distally wedge-shaped again and more or less elongate. The oblong joints in the lower part of the arm have both the anterior and posterior edges

everted and roughened; this soon changes to an eversion of the distal ends of the joints, which are finely spinous, and then to a strong overlapping of the distal ends: the joints in the proximal third of the arm have the dorsal surface perfectly smooth; in the outer two-thirds the dorsal surface is thickly set with longitudinal lines of fine spines directed forward, giving the outer part of the arms a peculiar velvety appearance. The costals, distichals, and first two brachials are in close apposition and sharply flattened laterally; the proximal third of the arm is remarkably deep and compressed, the outer two-thirds dorsally somewhat sharply rounded.

The first pinnule is 8 mm. long with twenty joints, the first three not so long as broad, with the corners cut away, the following squarish, gradually becoming elongate, and distally about twice as long as broad; this pinnule is considerably longer and stouter than the following, stout basally, tapering gradually to a slender and delicate tip; it is, on the outer side of the rays, sharply flattened exteriorly; the next three pinnules are 6 mm. long with fifteen joints, most of them squarish, the basal two or three rather shorter, the distal rather longer: the following pinnules are of the same length, but rather broader and more sharply carinate, distally becoming rather longer, but remaining comparatively stout; the distal pinnules are 9 mm. or 10 mm. long, the first joint rounded-triangular, concave anteriorly, the second squarish, the remainder longer than broad, becoming about twice as long as broad distally.

*Color* (in spirits).—Yellowish brown: the containing liquid is stained the same color.

*Type*.—Cat. No. 22696, U.S.N.M. From Misaki, Sagami Bay, Japan. (Owston collection, No. 8141.)

Genus CHARITOMETRA A. H. Clark.

CHARITOMETRA DISTINCTA (P. H. Carpenter).

“*Sagami Bay*.”

One perfect specimen, agreeing with Carpenter's description and figure, but possessing 33 arms.

CHARITOMETRA LATA (A. H. Clark).

*Sagami Bay*; off Misaki; July, 1902. (Owston collection, No. 6969.)

One specimen, larger than the type, but with the calyx and arm bases slightly less rugged, and yellow in color; probably not quite mature.



## Family TROPIOMETRIDÆ.

Genus CALOMETRA A. H. Clark.

CALOMETRA FLAVOPURPUREA (A. H. Clark).

*Sagami Bay*; 35° 03' north latitude, 138° 47' east longitude; 85 fathoms. (Owston collection, No. 7010.)

One specimen.

*Sagami Bay*; 35° 04' north latitude, 138° 41' east longitude; 110 fathoms; August 6, 1902. (Owston collection, No. 7061.)

Six specimens.

*Sagami Bay*; 35° 03' north latitude, 138° 47' east longitude; 110 fathoms; August 28, 1902. (Owston collection, No. 7189.)

One specimen.

CALOMETRA SEPARATA (A. H. Clark).

*Sagami Bay*; 34° 59' north latitude, 139° 34' east longitude; 55 fathoms; April 23, 1902. (Owston collection, No. 6332.)

Two specimens.

CALOMETRA MULTICOLOR (A. H. Clark).

*Sagami Bay*; 35° 08' north latitude, 139° 42' east longitude; 30 fathoms; October 12, 1902. (Owston collection, No. 7282.)

Three specimens.

*Sagami Bay*; same locality and depth; May 25, 1902. (Owston collection, No. 6930.)

Two specimens.

*Sagami Bay*; off Okinose; 55 fathoms; October 27, 1901. (Owston collection, Nos. 5417 and 6358.)

Three specimens.

*Sagami Bay*; 35° 02' north latitude, 138° 50' east longitude; 55 fathoms. (Owston collection, No. 7036.)

One 10-armed young.

*Sagami Bay*; off Sunosaki; 55 fathoms; May 8, 1899. (Owston collection, No. 5417.)

One very small 10-armed young.

*Sagami Bay*; 35° 06' north latitude, 139° 42' east longitude; 30 fathoms; April 24, 1902 (Owston collection, No. 7215): or 34° 59' north latitude, 139° 33' east longitude; 60 fathoms; April 20, 1902. (Owston collection, No. 7214.)

Thirteen specimens.

*Sagami Bay*; 34° 58' north latitude, 138° 45' east longitude; 77 fathoms; August 13, 1902. (Owston collection, No. 9274.)

One specimen.

*Sagami Bay*;  $35^{\circ} 13'$  north latitude,  $139^{\circ} 45'$  east longitude; 40 fathoms; November 9, 1902. (Owston collection, No. 7283.)

One specimen.

*Sagami Bay*;  $34^{\circ} 59'$  north latitude,  $139^{\circ} 34'$  east longitude; 60 fathoms; April 17, 1902. (Owston collection, No. 6931.)

Six specimens, including one 10-armed young.

*Sagami Bay*;  $35^{\circ} 08'$  north latitude,  $139^{\circ} 42'$  east longitude; 30 fathoms; May 25, 1902. (Owston collection, No. 6930.)

Two specimens.

*Sagami Bay*;  $35^{\circ} 04'$  north latitude,  $138^{\circ} 41'$  east longitude; 110 fathoms; August 6, 1902. (Owston collection, No. 7061.)

One specimen.

*Sagami Bay*;  $35^{\circ} 11'$  north latitude,  $139^{\circ} 45'$  east longitude; 50 fathoms; June 30, 1901.

Three specimens.

*Sagami Bay*;  $35^{\circ} 09'$  north latitude,  $139^{\circ} 42'$  east longitude; 30 to 40 fathoms; May 4, 1902. (Owston collection, No. 6428.)

One specimen.

*Sagami Bay*;  $34^{\circ} 59'$  north latitude,  $139^{\circ} 34'$  east longitude; 55 fathoms; April 23, 1902. (Owston collection, No. 6332.)

Two specimens.

*Sagami Bay*;  $35^{\circ} 08'$  north latitude,  $139^{\circ} 42'$  east longitude; 30 fathoms; October 12, 1902. (Owston collection, No. 7282.)

One specimen.

*Sagami Bay*; same locality and depth; May 25, 1902. (Owston collection, No. 6930.)

One specimen.

*Sagami Bay*;  $35^{\circ} 03'$  north latitude,  $139^{\circ} 42'$  east longitude; 30 fathoms; October 12, 1902. (Owston collection, No. 7283.)

One specimen.

*Sagami Bay*;  $35^{\circ} 13'$  north latitude,  $139^{\circ} 45'$  east longitude; 40 fathoms; November 9, 1902. (Owston collection, No. 7283.)

One specimen.

*Tokyo Bay*; Uraga Channel; 25 fathoms; May 26, 1901. (Owston collection, No. 6067.)

One large 10-armed specimen.

*Tokyo Bay*; Uraga Channel; 20 to 30 fathoms; April 21, 1901. (Owston collection, No. 5781.)

One specimen.

*Tokyo Bay*; Uraga Channel; 30 fathoms; May 17, 1901. (Owston collection, No. 6052.)

Two specimens.

## Genus TROPIOMETRA A. H. Clark.

## TROPIOMETRA AFRA (Hartlaub).

The collection contains seven specimens of this interesting species. In view of its apparent rarity, the following notes may prove of interest:

*Sagami Bay*; 37° 07' north latitude, 139° 44' east longitude; 21 fathoms. November 11, 1901. (Owston collection, No. 5915.)

Four specimens, all deep purple in color.

*No. 1.*—The arms are 210 mm. long, the calyx 30 mm. in diameter at the level of the first syzygy; there are thirty-six cirri 50 mm. long, with thirty-seven to forty-three (usually about forty) joints; two of the cirri have the distal portion broken off and regenerated, though the regenerated portion has not yet reached the normal stoutness. Regeneration of the cirri appears to be rare among the comatulids, having been heretofore reported only in *Tropiometra carinata*, and, more recently, in *Decametrocrinus vanhoeffenianus*. The first pinnule is 23 mm. long with thirty to thirty-five joints; the second pinnule is rather stouter, 24 mm. long, with a similar number of joints; the third pinnule is similar to the second; the following pinnules gradually decrease in length, the sixth being 22 mm. long, the eighth 18 mm., and the ninth 16 mm.

*No. 2.*—The arms are 180 mm. long, the calyx 25 mm. in diameter at the level of the first syzygy; there are twenty-four cirri 40 mm. long with thirty-four to thirty-eight (usually thirty-seven) joints; the lower pinnules are all broken.

*No. 3.*—The arms are 170 mm. long, the calyx 23 mm. in diameter at the level of the first syzygy; there are twenty-five cirri 40 mm. long with thirty-four to thirty-seven (usually nearer the latter) joints.

*No. 4.*—The arms are 130 mm. long, the calyx 20 mm. in diameter at the level of the first syzygy; there are twenty-eight cirri 40 mm. long with thirty-four joints.

*Sagami Bay*; off Misaki. (Owston collection, No. 8139.)

One specimen with arms 210 mm. long; it has twenty-eight cirri 40 mm. long with thirty to thirty-five (usually thirty-four) joints; the pinnules are as in No. 1 from the preceding station. The color (in formalin) is yellow.

*Sagami Bay*; off Misaki; June, 1903.

One specimen with arms 230 mm. long; it has twenty-eight cirri 40 mm. long with twenty-nine to thirty-five (usually nearer the latter) joints.

*Sagami Bay*; 35° 15' north latitude, 139° 48' east longitude; 10 fathoms; November 23, 1902. (Owston collection, No. 7285.)

One specimen with arms 200 mm. long; there are thirty-five cirri 40 mm. long, with twenty-seven to thirty-six (usually about thirty-three) joints.

I cannot find any tangible difference between the Japanese form described in 1895 by Hara under the name of *macrodiscus*, and the Australian *afra* described by Hartlaub two years earlier, of which the U. S. National Museum possesses a dried specimen from the South Pacific. The latter agrees in all particulars with the Japanese specimens, and has rather more cirrus joints than did Hartlaub's type, these numbering about thirty-three, as stated in Hara's description of *macrodiscus*.

### Family ANTEDONIDÆ.

#### Genus PEROMETRA A. H. Clark.

##### PEROMETRA DIOMEDEÆ (A. H. Clark).

*Sagami Bay*; 35° 03' north latitude, 138° 47' east longitude; 85 fathoms. (Owston collection, No. 7010.)

One large and pale specimen: one ray is dwarfed, the arms being about half the size of the others; the first costal is lacking, the costal axillary springing direct from the radial; there is no trace of any tubercular elevation; between the first and second brachials on the left arm of this ray there is a partial additional second brachial, which is visible externally dorsally from the outer side of the arm to the median line, its length in the direction of the long axis of the arm being about half as great; this partial joint rises to a strong tubercle proximally, and a less strong tubercle distally; it does not bear a pinnule.

*Sagami Bay*; 35° 04' north latitude, 138° 41' east longitude; 110 fathoms; August 6, 1902. (Owston collection, No. 7061.)

One large and pale specimen.

#### Genus ERYTHROMETRA A. H. Clark.

##### ERYTHROMETRA RUBER (A. H. Clark).

*Sagami Bay*; 34° 59' north latitude, 139° 34' east longitude; 55 fathoms; April 23, 1902. (Owston collection, No. 6332.)

One specimen, resembling the type.

#### Genus COMPSOMETRA A. H. Clark.

##### COMPSOMETRA SERRATA (A. H. Clark).

*Tokyo Bay*; 8-12 fathoms; October 22, 1899. (Owston collection, No. 5361.)

One specimen, resembling the type in the Museum of Comparative Zoology, which was taken at the same time and place.

## Genus IRIDOMETRA A. H. Clark.

## IRIDOMETRA PSYCHE (A. H. Clark).

*Sagami Bay*: 35° 06' north latitude, 139° 42' east longitude; 30 fathoms; April 24, 1902. (Owston collection, No. 7215.)

A single specimen somewhat smaller than the type and white in color, the arms crossed at the second syzygy with a purple band 2 mm. broad, and two narrower additional purple bands distally.

In addition to these comatulids Mr. Owston has frequently taken *Metacrinus rotundus* off the southern coast of Hondo, of which species I examined some very fine specimens when looking over his material in Yokohama.

## ADDITIONAL JAPANESE SPECIES.

In order to emphasize the uncertainty of securing any given species of comatulid in an area where it is known to occur, as well as to complete the list of species occurring along the southern shores of Japan from the Korean Straits to Tokyo Bay, I append the following list of species known from Japan, but not found by Mr. Owston during the course of his investigations, although occurring at such depths as to be accessible to him.

## Family COMASTERIDÆ.

## Genus COMATULA Lamarck.

*Comatula paucivirra* (Bell).

## Genus COMASTER L. Agassiz.

*Comaster marie* (A. H. Clark).

*Comaster multiradiata* (Linnæus).

*Comaster serrata* (A. H. Clark).

*Comaster solaster* (A. H. Clark).

## Family ZYGOMETRIDÆ.

## Genus CATOPTOMETRA A. H. Clark.

*Catoptometra hartlaubi* (A. H. Clark).

*Catoptometra kœhleri* (A. H. Clark).

*Catoptometra rubroflava* (A. H. Clark).

## Family HIMEROMETRIDÆ.

## Genus HIMEROMETRA A. H. Clark.

*Himerometra delicatissima* (A. H. Clark).

*Himerometra döderleini* (de Loriol).

*Himerometra stylifer* (A. H. Clark).

Genus CYLLOMETRA A. H. Clark.

*Cyllometra tigrina* (A. H. Clark).

Family THALASSOMETRIDÆ.

Genus THALASSOMETRA A. H. Clark.

*Thalassometra albofara* (A. H. Clark).

*Thalassometra diadema* (A. H. Clark).

*Thalassometra hana* (A. H. Clark).

*Thalassometra latipinna* (P. H. Carpenter).

*Thalassometra pubescens* (A. H. Clark).

Genus CHARITOMETRA A. H. Clark.

*Charitometra garrettiana* (A. H. Clark).

*Charitometra hepburniana* (A. H. Clark).

Genus PÆCILOMETRA A. H. Clark.

*Pæcilometra acula* (P. H. Carpenter).

Family TROPIOMETRIDÆ.

Genus CALOMETRA A. H. Clark.

*Calometra callista* (A. H. Clark).

*Calometra versicolor* (A. H. Clark).

Genus ASTEROMETRA A. H. Clark.

*Asterometra anthus* (A. H. Clark).

*Asterometra macropoda* (A. H. Clark).

Family ANTEDONIDÆ.

Genus NANOMETRA A. H. Clark.

*Nanometra bowersi* (A. H. Clark).

Genus IRIDOMETRA A. H. Clark.

*Iridometra adrestine* (A. H. Clark).

*Iridometra briseis* (A. H. Clark).

*Iridometra minuta* (A. H. Clark).

Genus THAUMATOMETRA A. H. Clark.

*Thaumatometra alternata* (P. H. Carpenter)

*Thaumatometra parva* (A. H. Clark).

Genus HELIOMETRA A. H. Clark.

*Helimetra clio* (A. H. Clark).

*Helimetra ludice* (A. H. Clark).

*Helimetra mariæ* (A. H. Clark).

## Genus THYSANOMETRA A. H. Clark.

*Thysanometra tenelloides* (A. H. Clark).

## Family PENTAMETROCRINIDÆ.

## Genus DECAMETROCRINUS Minckert.

*Decametrocrinus borealis* (A. H. Clark).

## Genus PENTAMETROCRINUS A. H. Clark.

*Pentametrocrinus diomedea* (A. H. Clark).*Pentametrocrinus japonicus* (P. H. Carpenter).*Pentametrocrinus tuberculatus* (A. H. Clark).*Pentametrocrinus varians* (P. H. Carpenter).

The stalked crinoids known from the seas about southern Japan are:

*Metacrinus angulatus* (P. H. Carpenter).*Metacrinus rotundus* (P. H. Carpenter).*Metacrinus superbus* (P. H. Carpenter).*Carpenteroocrinus mollis* (P. H. Carpenter).*Phrynoocrinus nudus* (A. H. Clark).*Bathycrinus pacificus* (A. H. Clark).

I have examined the following species labeled, probably erroneously, as from Japan:

*Himerometra crassipinna* (Hartlaub).

The United States National Museum possesses Japanese specimens of all the stalked crinoids listed, and of all the comatulids except *Comaster multiradiata*, *Himerometra döderleini*, *Thalassometra latipinna*, and *Thaumatometra alternata*.

There can be no doubt that there are yet many crinoids, especially comatulids, occurring about Japan of which we have no knowledge.